"Can Finance Be Easier?"

March 22, 2013

Today's Webinar

- Housekeeping
- Introduction
- Presentation
- Q&A
- Announcements

Today's Webinar Host

Wendy Boyle
Director of Operations

Webinar Moderator

David McFeely
Director of Grants & Government Programs

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Housekeeping & Logistics

- For best audio fidelity we will be in presentation or audience muted mode.
- If you plan to use a phone for the audio, please be sure to TURN OFF your Laptop microphone.
- Best to use a "land-line" with headset, NOT built-in laptop microphone. If you hear feedback please immediately check your audio setup.
- We will be monitoring the Question line for:
  - Notifying the moderator of any GoToWebinar Issues
  - Posting any questions for the Q&A session. We'll select, and pose your questions to the presenter at appropriate times.
- Follow-up questions can be sent to David McFeely, dmcfeely@solartech.org or 408-529-0508

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Thanks to Our Co-Sponsor *

Thanks to the National Renewable Energy Labs for participating in today's webinar and enabling the industry to solve the hidden solar financing soft costs issue.

SolarTech is honored to be able to participate

In the SAPC Program and continue its mission to lower finance costs.

Thanks to Our Sponsor *

SolarTech is honored to welcome

Trina Solar

as the sponsor of today's webinar series.

Trina Solar: A long-standing SolarTech member and Thought Leader in the Solar PV Industry. Trina Solar approached SolarTech in 2012 about creating a webinar series, and we are very thankful for their support.

Today's Presenters

David McFeely, SolarTech
Director of Grants and Industry Solutions

Michael Mendelsohn
SAPC Project Lead
NREL

Paul Detering
CEO
Tioga Energy

Dirk Michels
Partner
K&L Gates, LLP

Tim Keating
SCS Renewables
Sr. VP, Mercatus

SolarTech: Member Organization Driving Down Soft Costs and Growing the Market

Our Initiatives

Scalable

Local best practices

National impact

www.solartech.org

Our Board

Entire Value Chain

Systems Approach

Our Partners

Collaborative Consortium

Solar 3.0 Team

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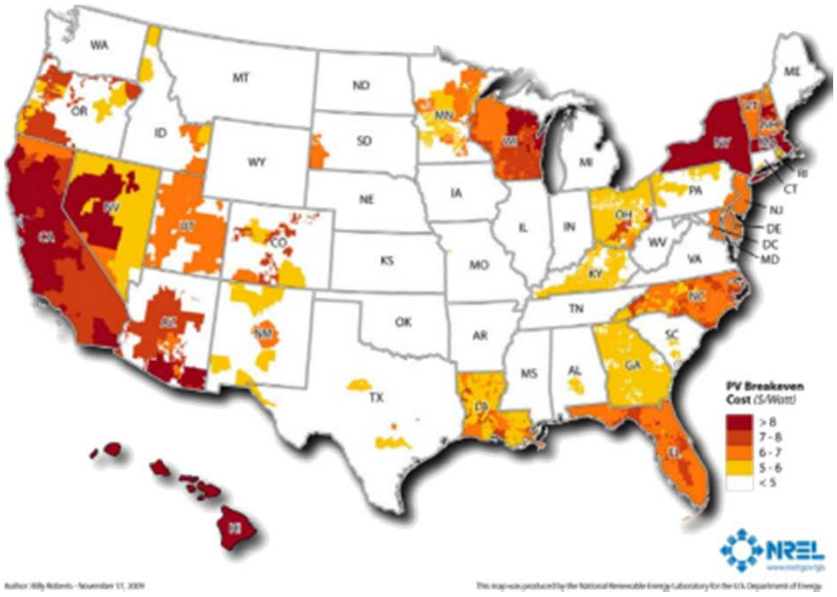
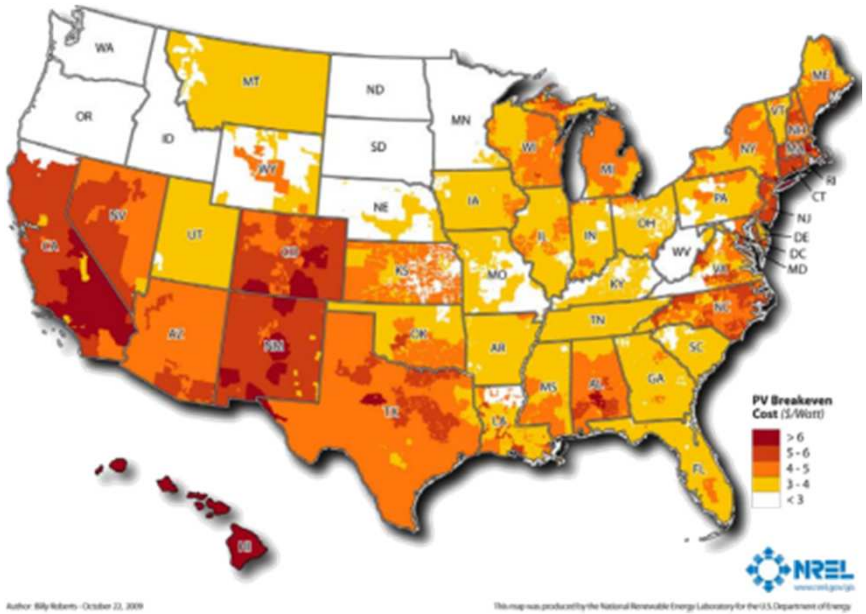
Where is the Industry headed?

- Residential PV break-even installed price in 2008 assuming full retail net metering, state incentives and 30% ITC.



- Residential PV break-even installed price in 2015 assuming full retail net metering and 30% ITC.



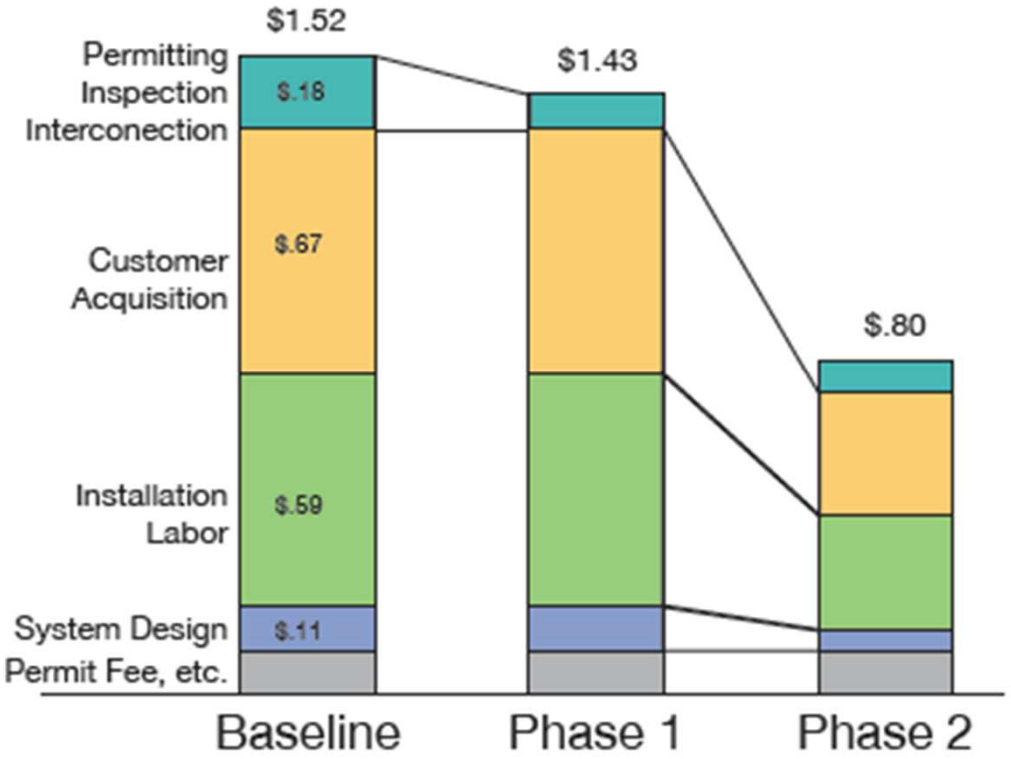
Source: Denholm, Margolis, Ong, Roberts "Break-Even Cost for Residential Photovoltaics in the United States: Key Drivers and Sensitivities" NREL 12/2009

SunShot U.S. Department of Energy

SolarTech

PV System Prices: National Competitiveness Concern

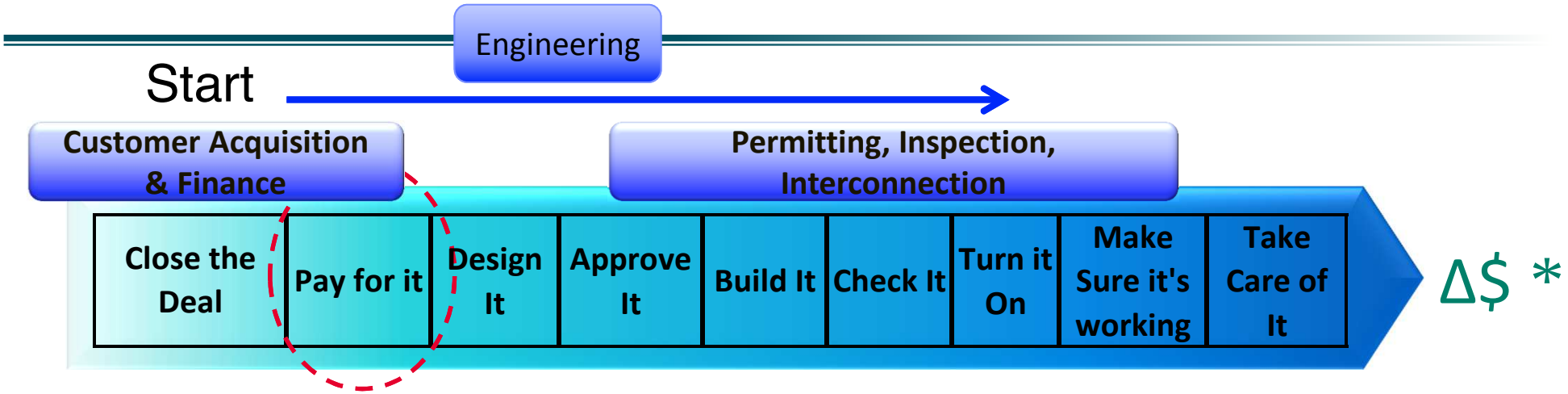
U.S. Challenge: High Soft Costs



Shrink the Cost Stack

Source: Ardani et al. *Quantifying Non-hardware Balance of System Costs for Photovoltaic Installations in the United states Using a Combined Annual Expenditure-Labor Hour productivity Approach.* National Renewable Energy Laboratory. 2012.

Goal: Reduce Soft Cost and inefficiency along the entire Value Chain to grow the business and revenue:



Target the Entire Value Chain and Identify Soft Cost Burdens in Permitting, Installation, Interconnection, Workforce, Finance & Performance

Achieve a **50% installation soft cost reduction** by standardizing the process, eliminating redundancy.

The time from customer contract through net metering,

Economic Development – Business and Job Growth in local, regional markets

Saving: $/W Residential
$W Commercial

SOLAR 3.0

SunShot U.S. Department of Energy

SolarTech

SOLAR 3.0

A National Platform for Process Innovation in Solar PV

SolarTech
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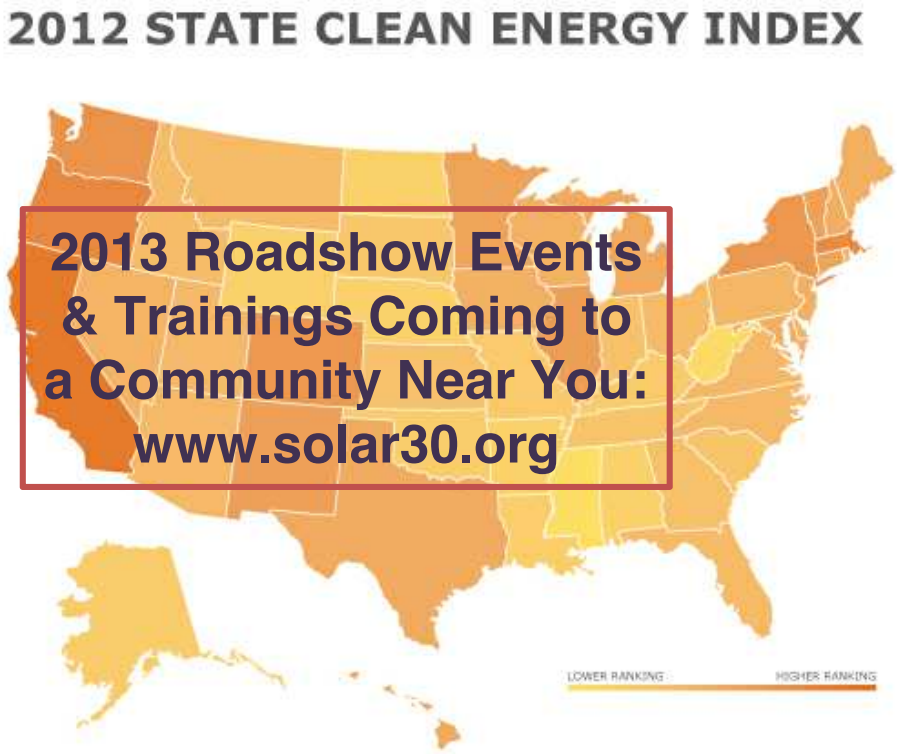
Program Overview

- 1000+ Communities
- 90+ Utilities, 500+ PV Installation Companies
- 1600 electrical and code officials trained
- 30,000 industry stakeholders
- 8 state target, organic adoption beyond

http://solar30.org/

2013 Roadshow Events & Trainings Coming to a Community Near You: www.solar30.org



RANK	STATE	SCORE	RANK	STATE	SCORE
1	California	91.1	26	Utah	38.1
2	Oregon	79.9	27	Virginia	37.6
3	Massachusetts	76.1	28	North Carolina	36.7
4	Washington	69.0	29	Florida	35.9
5	Colorado	65.1	30	Montana	35.8
6	New York	64.9	31	Ohio	35.7
7	Illinois	59.8	32	Idaho	35.7
8	New Mexico	58.1	33	Kansas	32.3
9	Vermont	56.5	34	Georgia	31.2
10	Minnesota	54.6	35	Indiana	30.4
11	Connecticut	54.0	36	Tennessee	27.7
12	Michigan	48.9	37	South Carolina	26.6
13	Texas	48.3	38	South Dakota	25.8
14	Hawaii	48.0	39	Missouri	22.5
15	New Hampshire	47.4	40	Kentucky	20.9
16	Maine	44.7	41	Oklahoma	20.2
17	Maryland	44.6	42	Alaska	19.8
18	New Jersey	44.6	43	Louisiana	18.9
19	Iowa	44.6	44	Wyoming	17.4
20	Rhode Island	43.5	45	Nebraska	17.3
21	Wisconsin	43.2	46	Alabama	16.9
22	Delaware	43.2	47	North Dakota	16.1
23	Nevada	42.0	48	Arkansas	16.0
24	Pennsylvania	40.1	49	West Virginia	8.0
25	Arizona	39.0	50	Mississippi	4.1

Source: Clean Edge, Inc., 2012

SunShot
U.S. Department of Energy

"Can Finance Be Easier?

Can the Solar Financing Industry Streamline and Standardize?"

Michael Mendelsohn
Project Lead, SAPC
NREL, Golden Colorado

March 22, 2013 *

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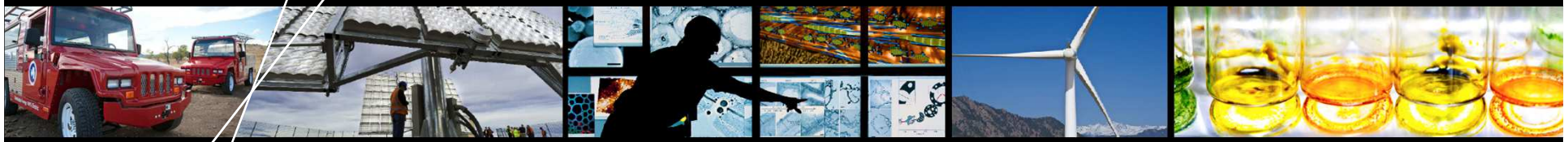
NATIONAL RENEWABLE ENERGY LABORATORY

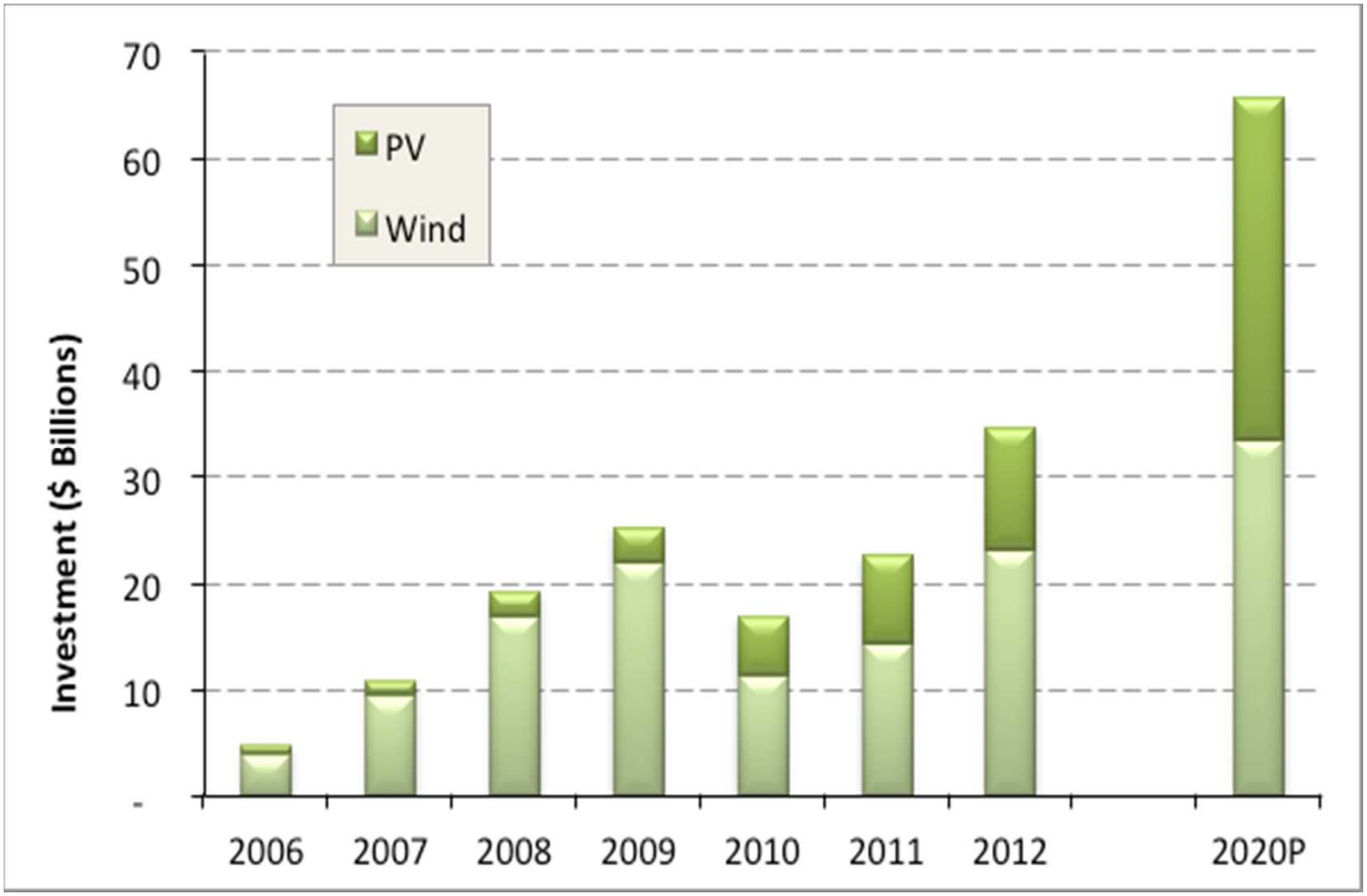
NREL's Securitization Activities



March 22, 2013

Michael Mendelsohn, NREL

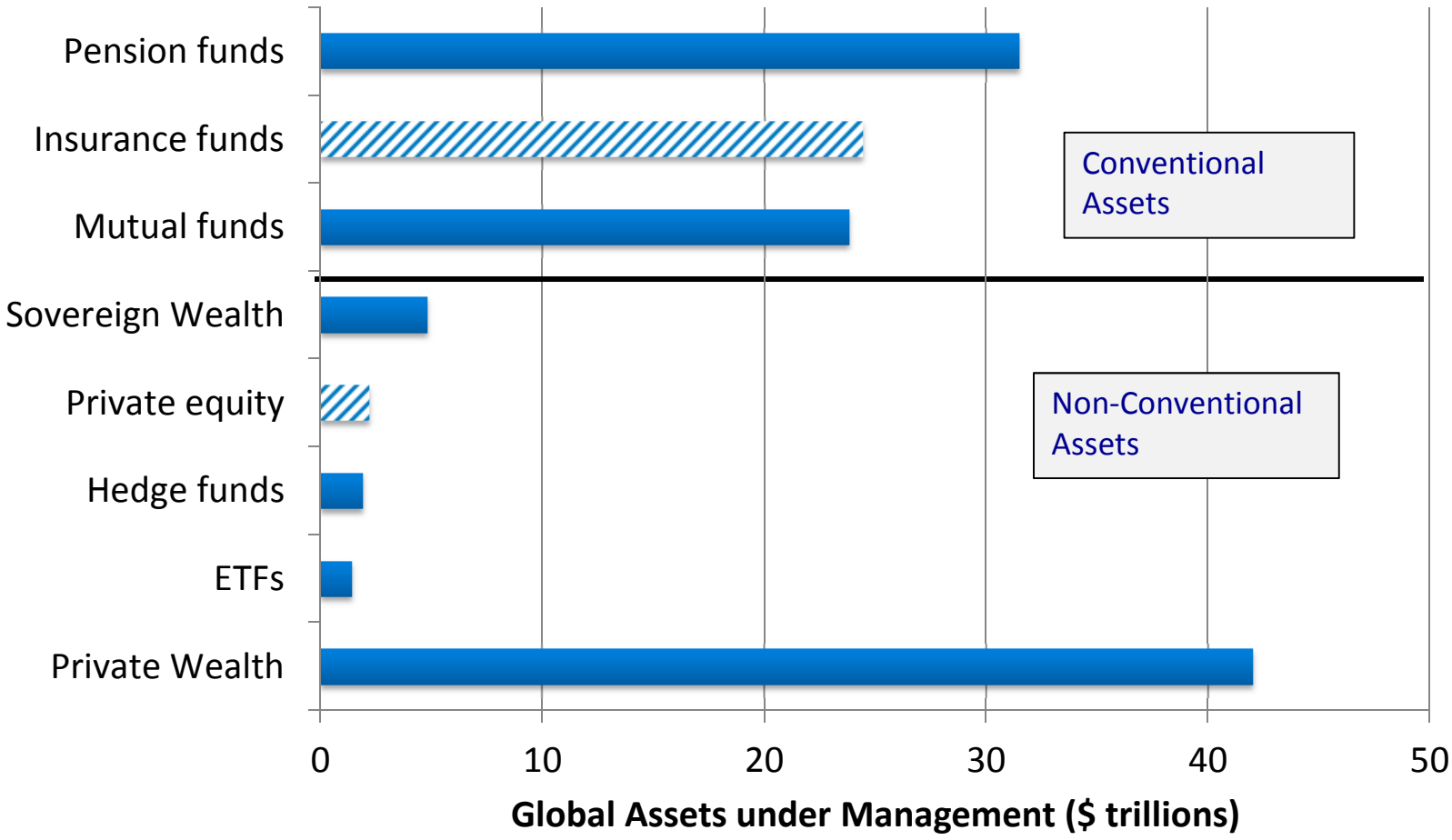
RE Industry Will Need a Lot More Capital



Assumes price and deployment goals of DOE SunShot Initiative and Wind programs

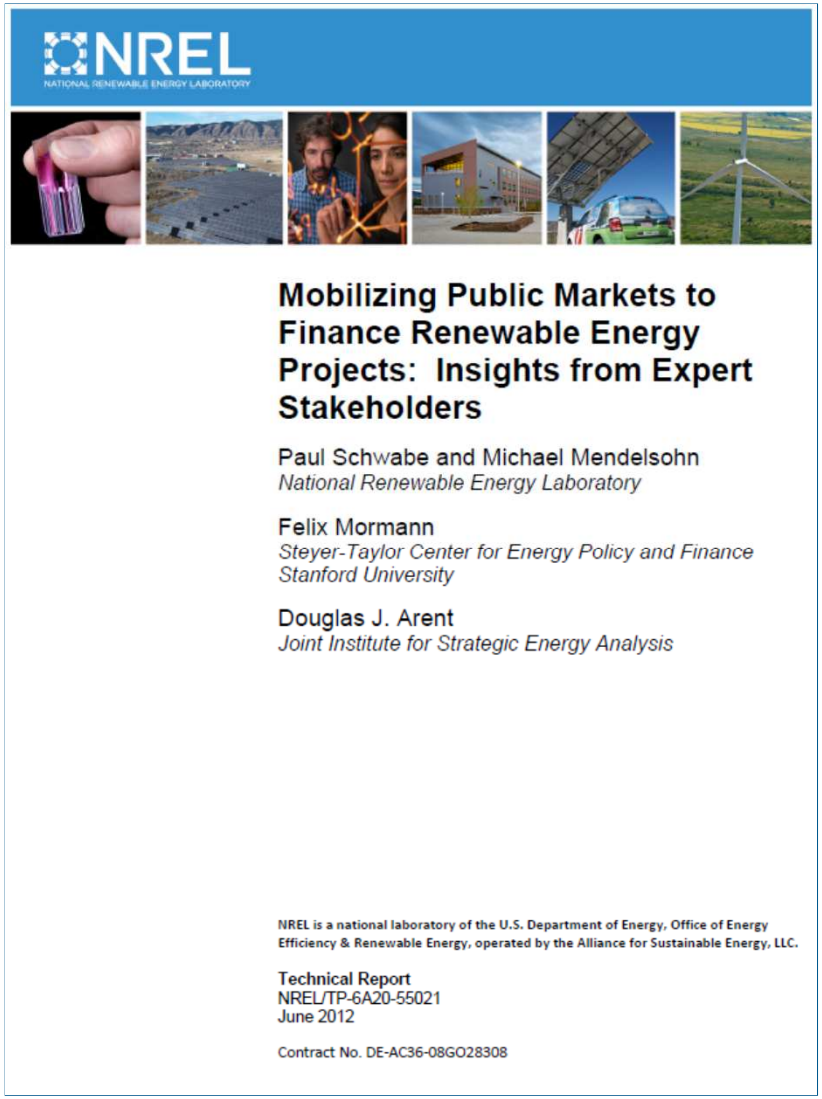
Draft Results; Source: *Financing U.S. Renewable Energy Projects Through Public Market Financing vs. Traditional Tax Equity: A Comparative Analysis* (forthcoming); Mendelsohn, M. Feldman, D.

Value: Expand the availability of capital /



Source: The CityUK *

Renewable Energy Investor Focus Groups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Mobilizing Public Markets to Finance Renewable Energy Projects: Insights from Expert Stakeholders

Paul Schwabe and Michael Mendelsohn
National Renewable Energy Laboratory

Felix Mormann
Steyer-Taylor Center for Energy Policy and Finance
Stanford University

Douglas J. Arent
Joint Institute for Strategic Energy Analysis

NREL is a national laboratory of the U.S. Department of Energy, Office of Energy Efficiency & Renewable Energy, operated by the Alliance for Sustainable Energy, LLC.

Technical Report
NREL/TP-6A20-55021
June 2012

Contract No. DE-AC36-08GO28308

Initiative:

Convened 40 renewable energy investors in NYC and Stanford, April '12

Partners:

Richard Kauffman, DOE;

Dan Reicher, Stanford;

Goals:

Investigate mechanisms to expand capital and lower costs of RE financing

Results:

- Public market mechanisms (e.g. REITs, MLPs) required to engage untapped retail and institutional capital
- Experts: NREL can provide the unbiased leadership to catalyze the effort

Download: http://www.nrel.gov/docs/fy12osti/55021.pdf

Solar Securitization – DOE Advanced Finance Project /

- **3 year Award from DOE with 3 primary tasks**
- **Task 1: Lead and Convene Standardization Working Groups** – standardize documents, and address other barriers.
- **Task 2: Securitization Analysis** – Assess securitization in other sectors, application to solar, and opportunities/constraints of existing and proposed policies, and evolving market conditions. Partnership with Stanford in formation
- **Task 3: Data Collection for Solar Securitization –** Collect solar performance and customer default data so new investors can understand investment risks
- **General progression of goals**
  - Year 1: standardize residential and C&I docs, develop performance and credit default datasets
  - Year 2: support standard contract adoption, extend dataset coverage, organize utility, PUC community to standardize legal & interconnection requirements / documentation
  - Year 3: assess remaining risk factors

SAPC Working Group – Goals & Description /

Goal:

Expand availability and lower the cost of solar through ubiquitous financing enabled by access to public capital: /

- Asset-backed Securities (ABS)
- Real Estate Investment Trusts (REITs)
- Master Limited Partnerships (MLPs)
- Other debt products

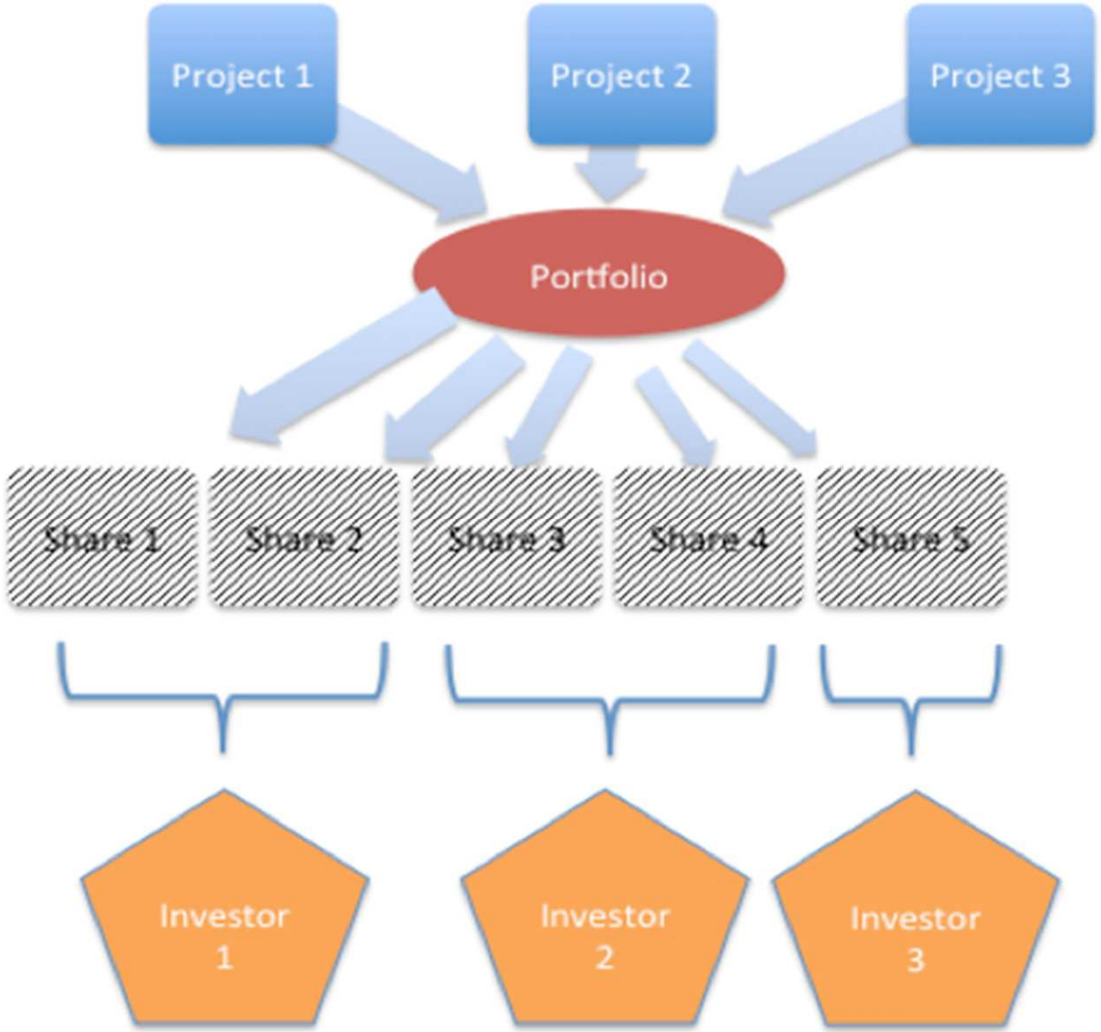
How:

By standardizing contracts and other documents relevant to the project development process:

- Lower risk perception and due diligence requirements
- Allow project pooling into tradable securities

By developing datasets and other tools to assess performance and credit default risk

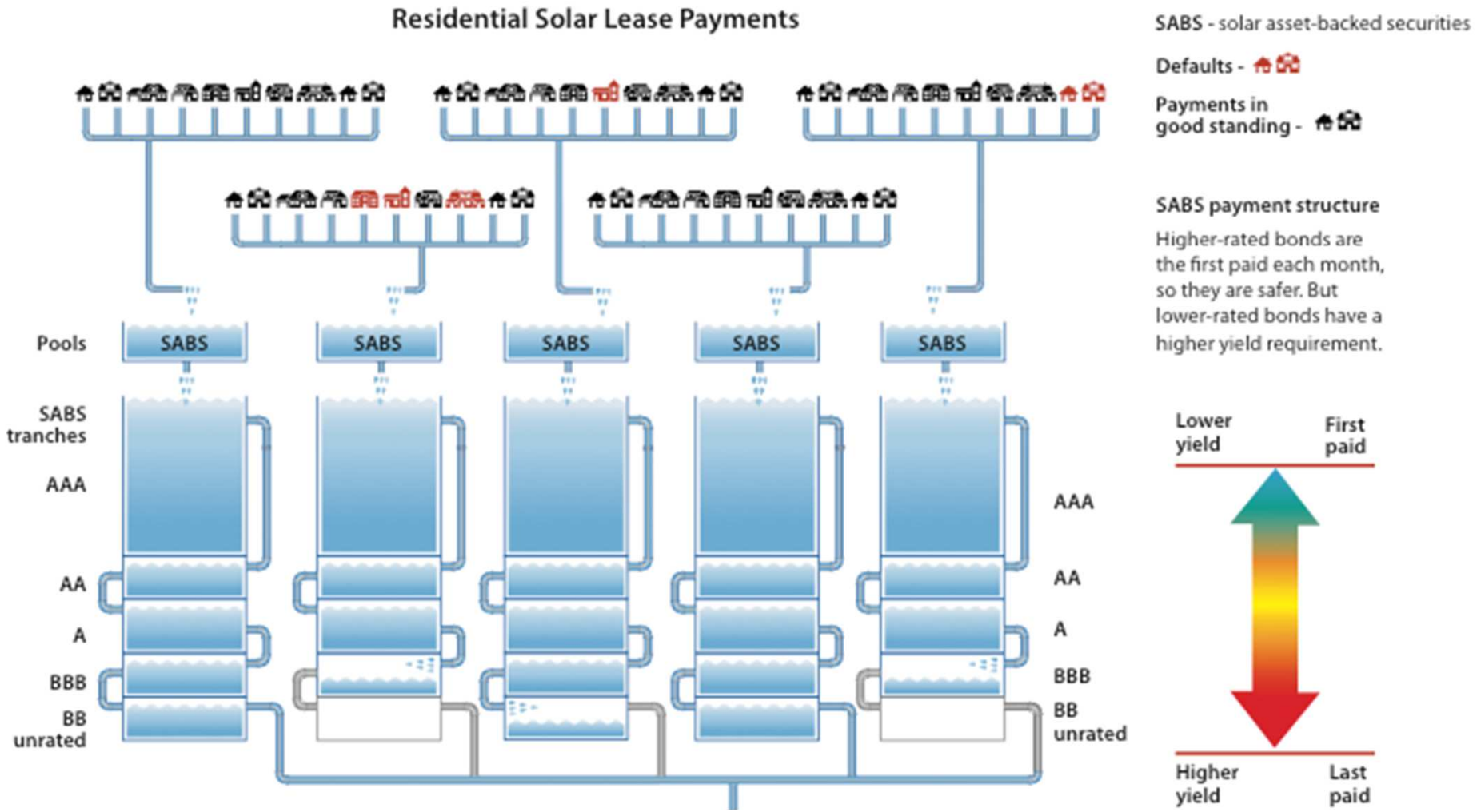
Securitization – Basic Premise /



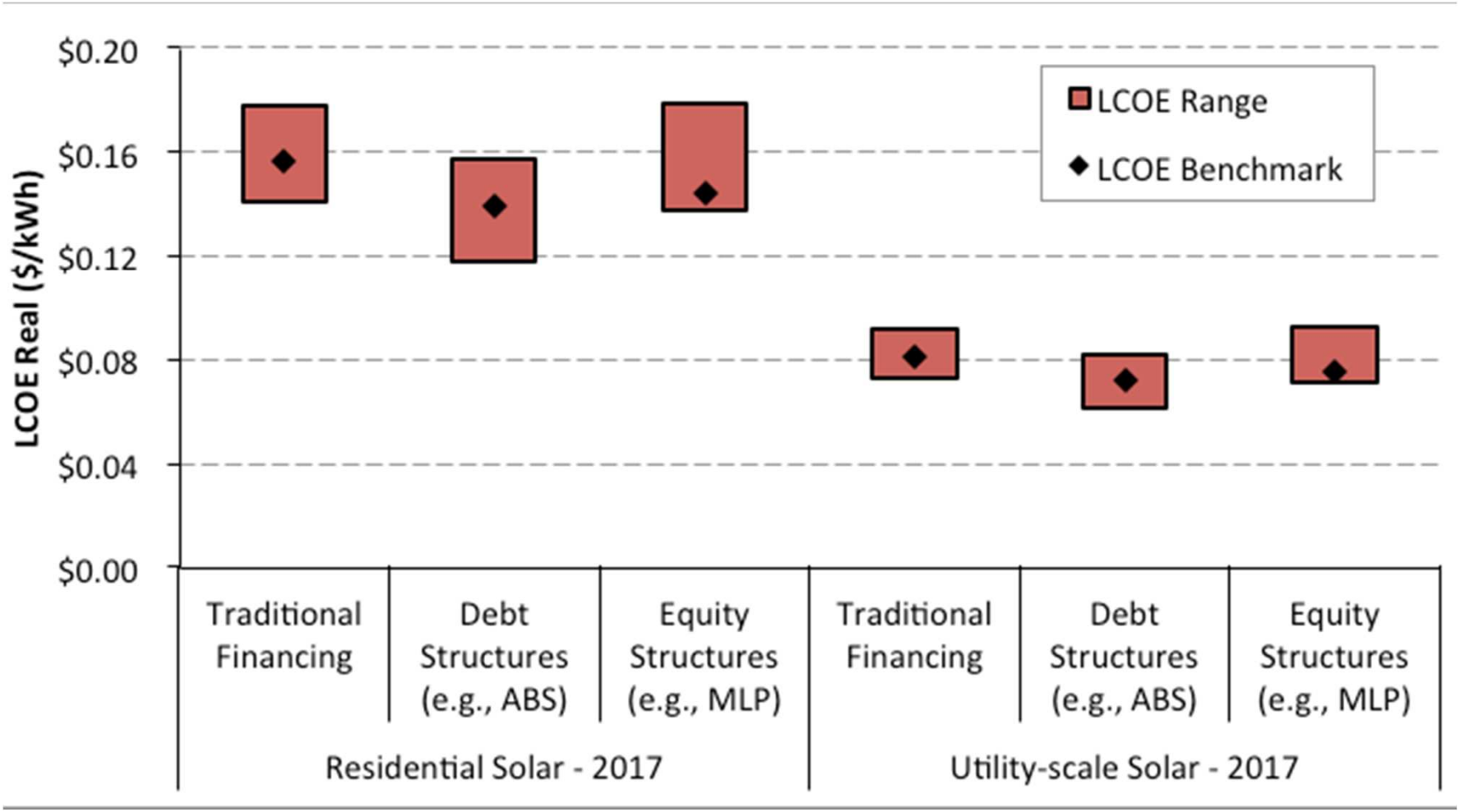
Investors seek assets that are:

- *liquid,*
- *tradable,*
- *priced by the market, and*
- *where risk and performance are easily measured and compared to other asset classes*

Solar Asset-backed Securities /



Public Capital Vehicles Could Lower LCOE 8-16% /



Draft Results; Source: *Financing U.S. Renewable Energy Projects Through Public Market Financing vs. Traditional Tax Equity: A Comparative Analysis* (forthcoming); Mendelsohn, M. Feldman, D.

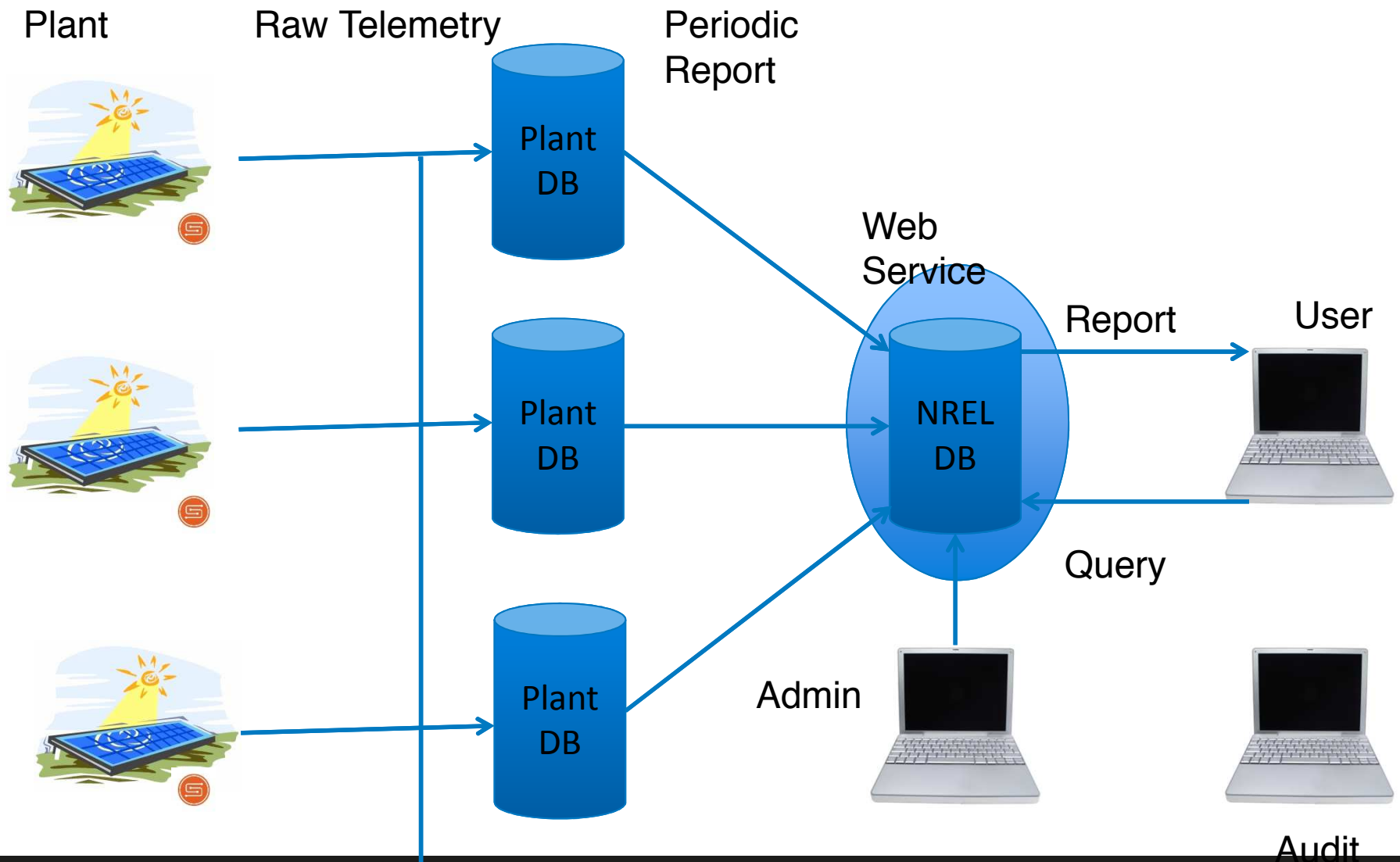
Current SAPC Participating Organizations /

Development	Legal	Investment / Market Maker	Analytics / Outreach
Borrego Solar	*Bingham McCutchen*	*B of A Merrill Lynch*	*DOE*
BrightGrid	*Chadbourne & Parke*	*CalCef*	*Kroll Bond Ratings*
CleanPath	*Ed Feo*	*Capital Fusion Partners*	*kWh Analytics*
Enfinity	*K&L Gates*	*Clean Power Finance*	*Rocky Mtn. Institute*
OneRoof Energy	*Nixon Peabody*	*Credit Agricole*	*SEPA*
Recurrent	*Orrick, Herrington…*	*Credit Suisse*	*SolarTech*
Rosendin Electric	*Sidley Austin*	*EcoPower Capital*	*Standard & Poor's*
SolarCity	*Stoel Rives*	*SCS Renewables*	*SunSpec*
Sungevity		*Union Bank*	
SunPower			
SunRun			
Tioga Energy			

O-SPaRC Data Initiative /

O-SPaRC: Open Solar Performance and Reliability Clearinghouse

O-SPaRC Database /



SAPC Progress Timeline Plan /

Contracts:

- **Jan 2013** — *Template contracts posted and analyzed*
- **March 2013** — *Contract consensus process*
- **Summer 2013** — *First set of SAPC created contracts*
- **Q3 – Q4 2013** — *Residential and C&I lease and PPA documents in place*

Data: /

- **Jan 2013** — *Initial data needs discussion*
- **March 2013** — *O-SPaRC Database rolled out; Initial planning of credit default database*
- **Summer 2013** — *Initial data collection for O-SPaRC; Credit default database development*
- **Q3-Q4 2013** — *Initial public viewing of O-SPaRC; Data acquisition for credit data*

Info on NREL's RE Project Finance Website

http://financeRE.nrel.gov

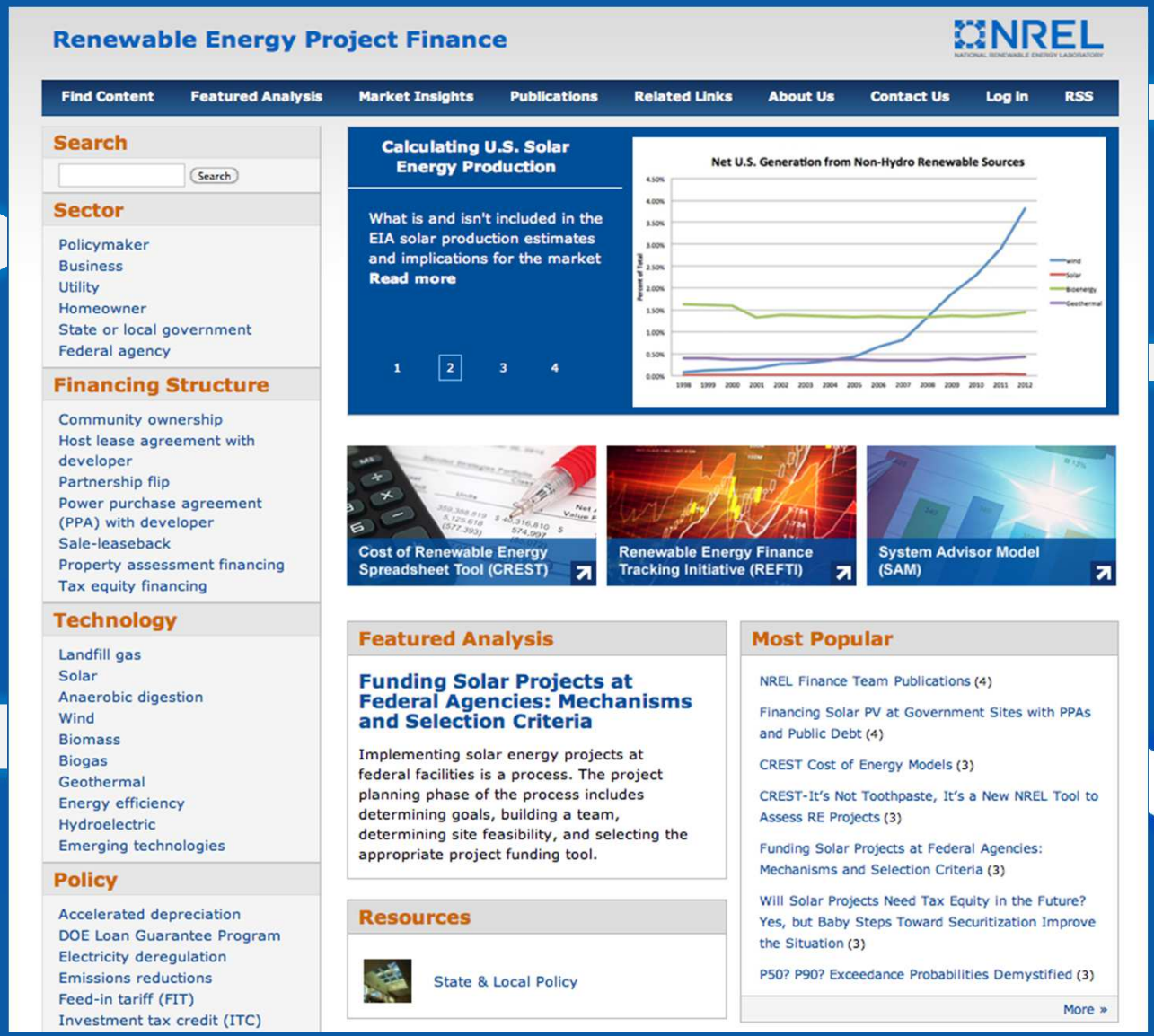
Search: by keyword, or using filters

Featured Analysis: In-depth NREL policy, market and financing analysis

User Login: to comment

Market Insights: Weekly policy and market observations from NREL analysts

ful Tools Data: ons for ncing data and LCOE analysis tools



Thank you /

Michael Mendelsohn
michael.mendelsohn@nrel.gov "
303-218-0456

Panel Discussion: Q&A & Next Steps

David McFeely, SolarTech
Director of Grants and Industry Solutions

Michael Mendelsohn
SAPC Project Lead
NREL

Paul Detering
CEO
Tioga Energy

Dirk Michels
Partner,
KL Gates, LLP

Tim Keating
SCS Renewables,
Sr. VP, Mercatus

SAPC Initiative Goals & Industry Contacts

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650-804-2867
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Goal: To improve the availability of lower cost and easier-to-access financial capital via public capital vehicles by:

- **Standardizing contracts and other documents relevant to the project development process**
- **Developing industry-wide datasets that support risk assessment and mitigation**

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Thanks to Our Sponsor

Many thanks to Trina Solar for sponsoring today's webinar, and assisting SolarTech in piloting this "Thought Leadership" webinar series.

Today's installment concludes this series. SolarTech is continuing to develop its 2013 calendar program.

Consider participating in the 2013 program and supporting the important work of SolarTech.

Contact SolarTech's Executive Director today:

mwalpert@solartech.org

Acknowledgements

SolarTech would like to acknowledge and thank today's panelists:

Paul Detering
Dirk Michels
Tim Keating

for their contribution, and Today's Co-Sponsor

Michael Mendelsohn and NREL for their industry Leadership solving solar finance soft costs.

Upcoming SolarTech Events

Stay tuned to www.solartech.org for upcoming announcements.

Rooftop Solar Challenge recently concluded, However we are submitting a new proposal for a second round, which will lead to many future State-wide programs when approved.

Watch www.solar30.org for upcoming webinars and workshops. We have an extensive program of events, trainings and services coming to a city near you for permitting, inspection and interconnection. We are in the planning stages of another Installation Workshop during the ASES conference in Baltimore, April 16th, stay tuned to Solar3.0.

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Local best practices

National impact

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Systems Approach

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Silicon Valley Leadership Group
PG&E
SunEdison
Southern California Edison
An Edison International Company
Applied Materials
oerlikon solar
SunPower
UL
REC Solar
North American Board of NABCEP
Clean Power Finance
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Tioga Energy
Silicon Valley Power
City of Santa Clara

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Vote Solar
SRA International, Inc.
International Association of Electrical Inspectors
SEPA solar electric power association
East Bay Green Corridor
Missouri
solar sonoma county
UL
Burnham
OnGrid Solar
Mainstream Energy
SunPower
Sierra Club
solarnexus

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Follow SolarTech, and have a great day.

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